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**UNITED STATES ARMY
ENVIRONMENTAL HYGIENE
AGENCY**

ABERDEEN PROVING GROUND, MD 21010

PRELIMINARY ASSESSMENT OF RELATIVE TOXICITY
OF 1-NITROSO-3,5-DINITRO-1,3,5-TRIAZACYCLOHEXANE
(MONONITROSO-RDX)
STUDY NUMBER 75-51-0345-82
JULY 1981 - APRIL 1982

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Preliminary assessment of the relative toxicity of Mononitroso-RDX was conducted to acquire information concerning the relative irritant and sensitization potential of this compound in animals. Mononitroso-RDX, following single application to rabbits, showed no potential for causing irritation to eyes or skin and in guinea pigs did not prove to be a sensitizer.		

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DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

Mr. Weeks/ldr/AUTOVON
584-3980

REPLY TO
ATTENTION OF

HSHB-LT/WP

16 AUG 1982

SUBJECT: Preliminary Assessment of Relative Toxicity of 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane (Mononitroso-RDX), Study Number 75-51-0345-82, July 1981 - April 1982

Commander
US Army Armament Research and
Development Command
ATTN: DRDAR-LCE
Dover, NJ 07801

EXECUTIVE SUMMARY

The purpose, essential findings, and major recommendation of the inclosed report follows:

- a. Purpose. To acquire information concerning the relative irritant and sensitization potential of mononitroso-RDX in animals.
- b. Essential Findings. Mononitroso-RDX, following single application to rabbits, showed no potential for causing irritation to eyes or skin. In guinea pigs it did not prove to be a sensitizer.
- c. Major Recommendation. Subject test chemical, a light yellow powder, should be handled with care and under the same chemical safety provisions required for a nonsensitive chemical explosive.

FOR THE COMMANDER:

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JOHN F. MAZUR
LTC, MSC

Director, Laboratory Services

CF:
HQDA (DASG-PSP) wo Incl
Cdr, HSC (HSPA-P)
Comdt, AHS (HSHA-IPM)
Cdr, WRAMC (PVNTMED Actv)
Cdr, MEDDAC, Ft Monmouth (PVNTMED Actv) (2 cy)
C, USAEHA-Rgn Div North

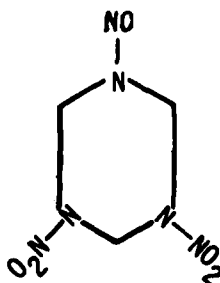


REPLY TO
ATTENTION OF
HSHB-LT/MP

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

PRELIMINARY ASSESSMENT OF RELATIVE TOXICITY
OF 1-NITROSO-3,5-DINITRO-1,3,5-TRIAZACYCLOHEXANE
(MONONITROSO-RDX)
STUDY NUMBER 75-51-0345-82
JULY 1981 - APRIL 1982

1. **AUTHORITY.** Letter, DRDAR-LCE, US Army Armament Research and Development Command, 23 July 1981, subject: Toxicological Hazards of N-Nitroso, N'N'Dinitro Triazine.
2. **REFERENCE.** Toxicology Division Standing Operating Procedures, US Army Environmental Hygiene Agency (USAEHA), 1981.
3. **PURPOSE.** The purpose of this study is to acquire information concerning the relative irritant and sensitization potential of mononitroso-RDX in animals. These preliminary studies will aid in advising on possible toxicological hazards associated with the handling and use of this compound.
4. **GENERAL.** The subject compound is a light yellow powder with a molecular weight of 206, melting point of 169-170°C, soluble in acetone, nitromethane and dioxane but only sparingly soluble in water. It is an insensitive explosive with an empirical formula of $C_3H_6N_6O_5$, and is identified with the structure given as follows:



5. **SUMMARY OF FINDINGS.** Hazard evaluation of the above named chemical was conducted using New Zealand White rabbits for skin and eye studies, and Hartley guinea pigs for a skin sensitization study. A literature search revealed no CAS number or chemical or toxicological information. A tabular presentation of animal toxicity data developed in this Agency follows:*†

*In conducting the studies described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals," US Department of Health, Education and Welfare Publication No. (NIH) 78-23, revised 1978.

†The experiments reported herein were performed in animal facilities fully accredited by the American Association for the Accreditation of Laboratory Animal Care.

Study No. 75-51-0345-82, Jul 81 - Apr 82

TABLE. PRESENTATION OF DATA.

Test	Results	Interpretation
SKIN IRRITATION STUDIES		
<u>Rabbits</u>		
Single 24-hour application to intact and abraded skin of New Zealand White rabbits. Dry technical grade chemical in the amount of 0.5 gm applied to each of six rabbits.	Chemical did not cause any irritation of the intact skin or of the skin surrounding an abrasion.	Chemical exhibits no potential for acute skin irritation and should be considered a non-irritating skin material.
EYE IRRITATION STUDIES		
<u>Rabbits</u>		
Single 24-hour application of 0.1 gm dry technical grade chemical to one eye of each of six New Zealand White rabbits. Three additional rabbits received 0.1 gm chemical to one eye followed in 20 seconds by a one minute gentle wash with warm tap water.	Chemical did not cause irritation to the eyes of rabbits under either unwashed or washed conditions.	Chemical exhibits no potential for acute eye irritation and should be considered a non-irritating eye material.

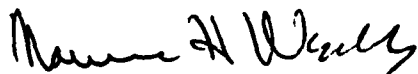
Study No. 75-51-0345-82, Jul 81 - Apr 82

Test	Results	Interpretation
SENSITIZATION STUDIES		
<u>Guinea Pigs (male)</u>		
Intradermal (ID) injections of 0.1 mL of a 0.1 percent solution (w/v) of the tested chemical in a mixture containing 1 volume of propylene glycol and 9 volumes of saline. Skin sensitizer, dinitrochlorobenzene (DNCB) was used in a mixture containing 1 volume of propylene glycol and 29 volumes of saline.		
Ten test guinea pigs for mononitroso-RDX were given 10 sensitizing doses over a 3-week period. After 2-weeks rest, they were challenged with ID injections of the test chemical.	Challenge dose of the tested chemical did not produce a sensitization reaction.	Mononitroso-RDX did not produce a sensitization reaction under test conditions and is not expected to produce a sensitization reaction in man.
Ten positive control guinea pigs were sensitized over a 3-week period with DNCB.	Challenge dose of DNCB in positive control guinea pigs produced a marked sensitization reaction in 10 out of 10 guinea pigs.	DNCB produced a marked reaction, indicating the guinea pigs respond to strong sensitizing agents.

Study No. 75-51-0345-82, Jul 81 - Apr 82

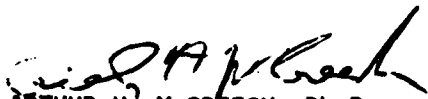
6. CONCLUSION. The chemical mononitroso-RDX, following single application to rabbits, showed no potential for causing irritation to eyes or skin and did not prove to be a sensitizer in guinea pigs. It is, therefore, concluded that mononitroso-RDX should be considered a nonirritating skin and eye material and a nonsensitizer. Systemic long-term studies are needed to delineate the toxicity parameters for a complete health hazard assessment of this compound.

7. RECOMMENDATIONS. Subject test chemical, 1-nitroso-3,5-dinitro-1,3,5-triazacyclohexane, a light yellow powder, should be handled under the same provisions usually required for a nonsensitive chemical explosive.



MAURICE H. WEEKS
Chief, Toxicity Evaluation Branch
Toxicology Division

APPROVED:



ARTHUR H. MCCREESH, Ph.D.
Chief, Toxicology Division

APPENDIX

ANALYTICAL QUALITY ASSURANCE

The Analytical Quality Assurance Office certifies the following with regard to this study:


a. This study was conducted in accordance with:

(1) Standing Operating Procedures developed by the Toxicology Division, USAEHA.

(2) Title 21, Code of Federal Regulations, 1981 rev, Part 58, Good Laboratory Practice for Nonclinical Laboratories Studies.

b. Facilities were inspected during its operational phase to insure compliance with paragraph a above.

c. The information presented in this report accurately reflects the raw data generated during the course of conducting the study.


PAUL V. SNEERINGER, PH.D.
Chief, Analytical Quality
Assurance Office